

## PATENT COOPERATION TREATY

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## INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY

(Chapter II of the Patent Cooperation Treaty)

(PCT Article 36 and Rule 70)

Applicant's or agent's file reference A3232.WO.209	<b>FOR FURTHER ACTION</b>	
	See Form PCT/IPEA/416	
International application No. PCT/IB2004/002330	International filing date (day/month/year) 15.07.2004	Priority date (day/month/year) 17.07.2003
International Patent Classification (IPC) or national classification and IPC B67B3/20, B67B3/28		
Applicant AZIONARIA COSTRUZIONI MACCHINE AUTOMATICHE.../		
<p>1. This report is the international preliminary examination report, established by this International Preliminary Examining Authority under Article 35 and transmitted to the applicant according to Article 36.</p> <p>2. This REPORT consists of a total of 5 sheets, including this cover sheet.</p> <p>3. This report is also accompanied by ANNEXES, comprising:</p> <ul style="list-style-type: none"> <li>a. <input checked="" type="checkbox"/> (<i>sent to the applicant and to the International Bureau</i>) a total of 6 sheets, as follows:           <ul style="list-style-type: none"> <li><input checked="" type="checkbox"/> sheets of the description, claims and/or drawings which have been amended and are the basis of this report and/or sheets containing rectifications authorized by this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions).</li> <li><input type="checkbox"/> sheets which supersede earlier sheets, but which this Authority considers contain an amendment that goes beyond the disclosure in the international application as filed, as indicated in item 4 of Box No. I and the Supplemental Box.</li> </ul> </li> <li>b. <input type="checkbox"/> (<i>sent to the International Bureau only</i>) a total of (Indicate type and number of electronic carrier(s)), containing a sequence listing and/or tables related thereto, in computer readable form only, as indicated in the Supplemental Box Relating to Sequence Listing (see Section 802 of the Administrative Instructions).</li> </ul>		
<p>4. This report contains indications relating to the following items:</p> <ul style="list-style-type: none"> <li><input checked="" type="checkbox"/> Box No. I Basis of the opinion</li> <li><input type="checkbox"/> Box No. II Priority</li> <li><input type="checkbox"/> Box No. III Non-establishment of opinion with regard to novelty, inventive step and industrial applicability</li> <li><input type="checkbox"/> Box No. IV Lack of unity of invention</li> <li><input checked="" type="checkbox"/> Box No. V Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement</li> <li><input type="checkbox"/> Box No. VI Certain documents cited</li> <li><input type="checkbox"/> Box No. VII Certain defects in the international application</li> <li><input type="checkbox"/> Box No. VIII Certain observations on the international application</li> </ul>		
Date of submission of the demand 13.05.2005	Date of completion of this report 05.10.2005	
Name and mailing address of the international preliminary examining authority:  European Patent Office - P.B. 5818 Patentlaan 2 NL-2280 HV Rijswijk - Pays Bas Tel. +31 70 340 - 2040 Tx: 31 651 epo nl Fax: +31 70 340 - 3016	Authorized Officer Wartenhorst, F Telephone No. +31 70 340-3641	



**INTERNATIONAL PRELIMINARY REPORT  
ON PATENTABILITY**

International application No.  
PCT/IB2004/002330

**Box No. I Basis of the report**

1. With regard to the **language**, this report is based on the international application in the language in which it was filed, unless otherwise indicated under this item.
  - This report is based on translations from the original language into the following language, which is the language of a translation furnished for the purposes of:
    - international search (under Rules 12.3 and 23.1(b))
    - publication of the international application (under Rule 12.4)
    - international preliminary examination (under Rules 55.2 and/or 55.3)
2. With regard to the **elements\*** of the international application, this report is based on (*replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report*):

**Description, Pages**

1-19 as originally filed

**Claims, Numbers**

1-13 received on 13.05.2005 with letter of 13.05.2005

**Drawings, Sheets**

1/6-6/6 as originally filed

- a sequence listing and/or any related table(s) - see Supplemental Box Relating to Sequence Listing

3.  The amendments have resulted in the cancellation of:
  - the description, pages
  - the claims, Nos. 14-17
  - the drawings, sheets/figs
  - the sequence listing (*specify*):
  - any table(s) related to sequence listing (*specify*):

4.  This report has been established as if (some of) the amendments annexed to this report and listed below had not been made, since they have been considered to go beyond the disclosure as filed, as indicated in the Supplemental Box (Rule 70.2(c)).
  - the description, pages
  - the claims, Nos.
  - the drawings, sheets/figs
  - the sequence listing (*specify*):
  - any table(s) related to sequence listing (*specify*):

\* If item 4 applies, some or all of these sheets may be marked "superseded."

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**Box No. V Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement**

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**1. Statement**

Novelty (N)	Yes:	Claims	1-13
	No:	Claims	
Inventive step (IS)	Yes:	Claims	1-13
	No:	Claims	
Industrial applicability (IA)	Yes:	Claims	1-13
	No:	Claims	

**2. Citations and explanations (Rule 70.7):**

**see separate sheet**

**INTERNATIONAL PRELIMINARY  
REPORT ON PATENTABILITY  
(SEPARATE SHEET)**

International application No.

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**Re Item V**

**Reasoned statement with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement**

Reference is made to the following document:

D1: US-A-4 535 583 (MURANAKA SHIARU ET AL) 20 August 1985 (1985-08-20)

**1 INDEPENDENT CLAIM 1**

- 1.1 The document D1 is regarded as being the closest prior art to the subject-matter of claim 1, and shows (the references in parentheses applying to this document): A capping unit comprising a conveyor (10), a motor (8), capping assemblies provided with gripping mechanisms (13), primary drive means (15, 16) setting a capping assembly in vertical motion and secondary drive means (12) connected to an electronic control device (19) setting a gripping mechanism in rotational motion.
- 1.2 The subject-matter of claim 1 differs from this known capping unit in that the primary drive means comprises an electric motor connected to the electronic control device, and in that the electronic controller comprises a processing block by means of which to vary the operating parameters of each primary and secondary electric motor according to the dimensions of the respective containers.

The subject-matter of claim 1 is therefore new (Article 33(2) PCT).

- 1.3 The problem to be solved by the present invention may be regarded as rendering the capping unit versatile and suitable for use with many types of containers irrespective of their size.

- 1.4 The solution to this problem proposed in claim 1 of the present application is considered as involving an inventive step (Article 33(3) PCT) for the following reasons:

The processing block of the controller provides the possibility to control the primary and secondary electric motors of each capping assembly independently, by means of the operating parameters, according to the dimensions of the containers, therewith, making the capping unit suitable to be used with any type of container.

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**2 DEPENDENT CLAIMS 2-13**

Claims 2-13 are dependent on claim 1 and as such also meet the requirements of the PCT with respect to novelty and inventive step.

Claims

1) A capping unit for closing containers (2) with respective caps (3), of the type comprising: a carrier and conveyor component (5) on which to advance the containers (2) and the relative caps (3);  
5 a motor (6) associated with the carrier and conveyor component (5), by which the selfsame component (5) is set in rotation about a respective primary axis (5a); a plurality of capping assemblies (11) associated with the carrier component (5), each positioned above a corresponding container (2) and capable of movement vertically between a first position, distanced from the respective container (2), and a second position actively engaging the container, wherein each capping  
10 assembly (11) presents a gripping mechanism (17) such as can be associated with a relative cap (3) when the corresponding capping assembly (11) is in the second position, and the gripping mechanism (17) is rotatable in such a way as to screw the cap (3) onto a threaded neck (4) of the respective container (2)  
15 about a respective secondary axis (17a); first drive means (14) presenting a plurality of primary electric motors (14a), each one of which associated with a respective capping assembly (11) by which the single capping assemblies (11) can be set in motion vertically, one independently of another; second  
20 drive means (18) presenting a plurality of secondary electric motors (18a), each one of which associated with a respective gripping mechanism (17) by which  
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the single gripping mechanisms (17) can be set in rotation one independently of another; and an electronic controller device (40) connected to each of the primary electric motors (14a) and the  
5 secondary electric motors (18a); characterized in that it further comprises a processing block (41) by means of which to vary the operating parameters of each primary electric motor (14a) and each secondary electric motor (18a) according to the dimensions of  
10 the respective containers (2).

2) A unit as in claim 1, wherein the carrier component (5) comprises:

- a drum (8) associated with the motor (6) and rotatable about the primary axis (5a);
- 15 - a base (9) associated with the bottom of the drum (8), on which to stand the containers (2);
- a platform (10), associated with the top of the drum (8) and facing the base (9), to which the capping assemblies (11) are mounted in a  
20 circumferential formation.

3) A unit as in claim 2, wherein each capping assembly (11) comprises a rod (12) inserted slidably through a relative guide (13) afforded by the platform (10), extending longitudinally in coaxial alignment with

the secondary axis (17a) and presenting a first end (12a) with which the respective gripping mechanism (17) is associated, and a second end (12b) opposite to the first end (12a).

5 4)A unit as in claim 3, wherein each primary electric motor (14a) occupies a position coinciding with the second end (12b) of the rod (12) and above the platform (10).

10 5)A unit as in claim 4, wherein each primary electric motor (14a) comprises a shaft (15) rotatable about a respective axis perpendicular to the secondary axis (17a), and a gear (15a) keyed to the shaft (15).

15 6)A unit as in claim 5, wherein each rod (12) presents a rack (16) extending longitudinally along the respective second end (12b) and engaged in meshing contact by the gear (15a) of each primary electric motor (14a), in such a way that the rod (12) can be set in motion vertically by rotation of the gear (15a).

20 7)A unit as in claims 3 to 6, wherein each secondary electric motor (18a) is mounted between the first end (12a) of the corresponding rod (12) and the gripping mechanism (17) and presents a shaft (19) rotatable about an axis parallel to the secondary axis (17a).

8)A unit as in claim 7, wherein the gripping mechanism (17) comprises:

- a gripper (20) attached to the shaft (19) of the respective secondary electric motor (18a), capable of movement between an open condition in which the relative capping assembly (11) is in the first position and a closed condition in which the relative capping assembly (11) is in the second position with the gripper (20) engaging the relative cap (3);

- an actuator (25) by which the gripper (20) is caused to alternate between the open and closed conditions;

- a transmission component (31) interposed between the gripper (20) and the actuator (25), by which motion is relayed from the actuator (25) to the gripper (20).

9)A unit as in claim 8, wherein the gripper (20) comprises:

- a carrier element (21) of substantially cylindrical appearance, associated coaxially with the shaft (19) of the secondary electric motor (18a);

- a plurality of jaws (22) hinged circumferentially to the cylindrical carrier element (21) and capable

of movement between a position drawn toward one another, corresponding to the closed condition of the gripper (20), and a position spread apart from one another, corresponding to the open condition of the  
5 gripper (20).

10) A unit as in claim 9, wherein each jaw (22) presents a substantially curved appearance and is identifiable as having a first end (22a) furnished with a following roller (23), a second end (22b) opposite to the first end (22a), furnished with a contact element (24) designed to engage the cap (3), and an intermediate portion (22c) disposed between the first end (22a) and the second end (22b); and hinged to carrier element (21).

15) A unit as in claim 8, wherein each transmission component (31) comprises a plunger (32) of substantially frustoconical geometry coaxially encircling and slidable along the shaft (19) of the secondary electric motor (18a), and a mechanical linkage (33) coupled rigidly to the plunger (32).  
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12) A unit as in claim 11, wherein the plunger (32) presents a downwardly tapering outer surface (32c), and the following roller (23) of each jaw (22) rolls vertically on the selfsame external surface (32c).

25) A unit as in claim 11, wherein the actuator (25) is a linear actuator coupled to the mechanical

linkage (33) in such a way as to induce a vertical movement of the plunger (32).